WHAT IS CLAIMED IS:

1. An isolated nucleic acid molecule comprising a nucleotide sequence selected from the group consisting of:

a) SEQ ID NO:1, 3, 5, 9, 11, 13, 15, 17, 19, 21, or 23, or a fragment thereof;

b) a sequence homologous to SEQ ID NO:1, 3, 5, 9, 11, 13, 15, 17, 19, 21, or 23, or a fragment thereof;

c) a sequence that encodes a polypeptide comprising SEQ ID NO:2, 4, 6, 10, 12, 14, 16, 18, 20, 22, or 24, or a fragment thereof; and

d) a sequence that encodes a polypeptide comprising an amino acid sequence homologous to SEQ ID NO:2, 4, 6, 10, 12, 14, 16, 18, 20, 22, or 24, or a fragment thereof;

said nucleic acid molecule encoding at least a portion of DmGPCR .

2. The nucleic acid molecule of claim 1 wherein said nucleic acid molecule is DNA.

3. The nucleic acid molecule of claim 1 wherein said nucleic acid molecule is RNA.

4. The nucleic acid molecule of claim 2 wherein said nucleotide sequence comprises SEQ ID NO:1, 3, 5, 9, 11, 13, 15, 17, 19, 21, or 23.

5. An isolated nucleic acid molecule comprising a nucleotide sequence complementary to at least a portion of SEQ ID NO:1, 3, 5, 9, 11, 13, 15, 17, 19, 21, or 23, a complement of said nucleic acid molecule encoding at least a portion of a DmGPCR.

6. The nucleic acid molecule of claim 5 wherein said molecule is an antisense oligonucleotide directed to SEQ ID NO:1, 3, 5, 9, 11, 13, 15, 17, 19, 21, or 23.

7. The nucleic acid molecule of claim 6 wherein said oligonucleotide is directed to a regulatory region of SEQ ID NO:1, 3, 5, 9, 11, 13, 15, 17, 19, 21, or 23.

8. An expression vector comprising a nucleic acid molecule of claim 1 or 5.

9. An expression vector of claim 8, wherein said nucleic acid molecule comprises SEQ ID NO:1, 3, 5, 9, 11, 13, 15, 17, 19, 21, or 23.

10. The vector of claim 8 wherein said vector is a plasmid.

11. The vector of claim 8 wherein said vector is a viral particle.

12. The vector of claim 11 wherein said vector is selected from the group consisting of adenoviruses, baculoviruses, parvoviruses, herpesviruses, poxviruses, adeno-associated viruses, Semliki Forest viruses, vaccinia viruses, and retroviruses.

13. The vector of claim 8 wherein said nucleic acid molecule is operably connected to a promoter selected from the group consisting of simian virus 40, mouse mammary tumor virus, long terminal repeat of human immunodeficiency virus, maloney virus, cytomegalovirus immediate early promoter, Epstein Barr virus, rous sarcoma virus, human actin, human myosin, human hemoglobin, human muscle creatine, and human metalothionein.

14. A host cell transformed with a vector of claim 8.

15. The transformed host cell of claim 14 wherein said cell is a bacterial cell.

16. The transformed host cell of claim 15 wherein said bacterial cell is *E. coli*.

17. The transformed host cell of claim 14 wherein said cell is a yeast.

18. The transformed host cell of claim 17 wherein said yeast is *S. cerevisiae*.

19. The transformed host cell of claim 14 wherein said cell is an insect cell.

20. The transformed host cell of claim 19 wherein said insect cell is *S. frugiperda*.

21. The transformed host cell of claim 14 wherein said cell is a mammalian cell.

22. The transformed host cell of claim 21 wherein mammalian cell is selected from the group consisting of chinese hamster ovary cells, HeLa cells, African green monkey kidney cells, human 293 cells, and murine 3T3 fibroblasts.

23. A method of producing a polypeptide comprising SEQ ID NO:2, 4, 6, 10, 12, 14, 16, 18, 20, 22, or 24, or a homolog or fragment thereof, comprising the steps of:

a) introducing a recombinant expression vector of claim 8 into a compatible host cell;

b) growing said host cell under conditions for expression of said polypeptide; and

c) recovering said polypeptide.

24. The method of claim 23 wherein said host cell is lysed and said polypeptide is recovered from the lysate of said host cell.

25. The method of claim 23 wherein said polypeptide is recovered by purifying the culture medium without lysing said host cell.

26. A composition comprising a nucleic acid molecule of claim 1 or 5 and an acceptable carrier or diluent.

27. A composition comprising a recombinant expression vector of claim 8 and an acceptable carrier or diluent.

28. An isolated polypeptide encoded by a nucleic acid molecule of claim 1.

29. The polypeptide of claim 28 wherein said polypeptide comprises SEQ ID NO:2, 4, 6, 10, 12, 14, 16, 18, 20, 22, or 24.

30. The polypeptide of claim 28 wherein said polypeptide comprises an amino acid sequence homologous to SEQ ID NO:2, 4, 6, 10, 12, 14, 16, 18, 20, 22, or 24.

31. The polypeptide of claim 30 wherein said sequence homologous to SEQ ID NO:2, 4, 6, 10, 12, 14, 16, 18, 20, 22, or 24 comprises at least one conservative amino acid substitution compared to SEQ ID NO:2, 4, 6, 10, 12, 14, 16, 18, 20, 22, or 24.

32. The polypeptide of claim 28 wherein said polypeptide comprises a fragment of SEQ ID NO:2, 4, 6, 10, 12, 14, 16, 18, 20, 22, or 24.

33. A composition comprising a polypeptide of claim 28 and an acceptable carrier or diluent.

34. An isolated antibody which binds to an epitope on a polypeptide of claim 28.

35. The antibody of claim 34 wherein said antibody is a monoclonal antibody.

36. A composition comprising an antibody of claim 34 and an acceptable carrier or diluent.

37. A method of inducing an immune response in a mammal against a polypeptide of claim 28 comprising administering to said mammal an amount of said polypeptide sufficient to induce said immune response.

38. A method for identifying a compound which binds DmGPCR comprising the steps of:

a) contacting DmGPCR with a compound; and

b) determining whether said compound binds DmGPCR.

39. The method of claim 38 wherein binding of said compound to DmGPCR is determined by a protein binding assay.

40. The method of claim 39 wherein said protein binding assay is selected from the group consisting of a gel-shift assay, Western blot, radiolabeled competition assay, phage-based expression cloning, co-fractionation by chromatography, co-precipitation, cross linking, interaction trap/two-hybrid analysis, southwestern analysis, and ELISA.

41. A method for identifying a compound which binds a nucleic acid molecule encoding DmGPCR comprising the steps of:

a) contacting said nucleic acid molecule encoding DmGPCR with a compound; and

b) determining whether said compound binds said nucleic acid molecule.

42. The method of claim 41 wherein binding is determined by a gel-shift assay.

43. A method for identifying a compound which modulates the activity of DmGPCR comprising the steps of:

a) contacting DmGPCR with a compound; and

b) determining whether DmGPCR activity has been modulated.

44. The method of claim 43 wherein said activity is neuropeptide binding.

45. The method of claim 43 wherein said activity is neuropeptide signaling.

46. A method for identifying a modulator of binding between a DmGPCR and a DmGPCR binding partner, comprising the steps of:

(a) contacting a DmGPCR binding partner and a composition comprising a DmGPCR in the presence and in the absence of a putative modulator compound;

(b) detecting binding between the binding partner and the DmGPCR; and

(c) determining whether binding in the presence of said putative modulator compound is increased or decreased compared to binding in the absence of said putative modulator compound.

47. A method according to claim 46 wherein the DmGPCR is DMGPCR1 and wherein the binding partner is a peptide selected from the group consisting of SEQ ID NOS: 25 through 33.

48. A method according to claim 47 wherein the binding partner is a peptide represented by SEQ ID NO:26

49. A method according to claim 47 wherein the binding partner is a peptide represented by SEQ ID NO:27

50. A method according to claim 46 wherein the DmGPCR is DMGPCR4 and wherein the binding partner is a peptide selected from the group consisting of SEQ ID NOS: 34 through 37.

51. A method according to claim 50 wherein the binding partner is a peptide represented by SEQ ID NO:34

52. A method according to claim 50 wherein the binding partner is a peptide represented by SEQ ID NO:35

53. A method according to claim 50 wherein the binding partner is a peptide represented by SEQ ID NO:36

54. A method according to claim 50 wherein the binding partner is a peptide represented by SEQ ID NO:37

55. A method according to claim 46 wherein the DmGPCR is DMGPCR6a and wherein the binding partner is a peptide selected from the group consisting of SEQ ID NOS: 38 through 59.

56. A method according to claim 46 wherein the DmGPCR is DMGPCR6aL and wherein the binding partner is a peptide selected from the group consisting of SEQ ID NOS: 60 through 157

57. A method according to claim 46 wherein the DmGPCR is DMGPCR6bL and wherein the binding partner is a peptide selected from the group consisting of SEQ ID NOS: 60 through 157

58. A method according to claim 46 wherein the DmGPCR is DMGPCR6bL and wherein the binding partner is a peptide selected from the group consisting of SEQ ID NOS: 60 through 156

59. A method according to claim 46 wherein the DmGPCR is DMGPCR9 and wherein the binding partner is a peptide represented by SEQ ID NO:157

60. A compound identified by the method of any of claims 38, 41, 43 or 46.

61. A method of identifying an animal homolog of DmGPCR comprising the steps:

a) screening a nucleic acid database of the animal with SEQ ID NO:1, 3, 5, 9, 11, 13,

15, 17, 19, 21, or 23, or a portion thereof; and

b) determining whether a portion of said library or database is homologous to said SEQ ID NO:1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, or 23, or portion thereof.

62. A method of identifying an animal homolog of DmGPCR comprising the steps:

a) screening a nucleic acid library of the animal with a nucleic acid molecule having a nucleotide sequence selected from the group consisting of SEQ ID NO:1, 3, 5, 9, 11, 13, 15, 17, 19, 21, or 23, or a portion thereof; and

b) determining whether a portion of said library or database is homologous to said SEQ ID NO:1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, or 23, or portion thereof.